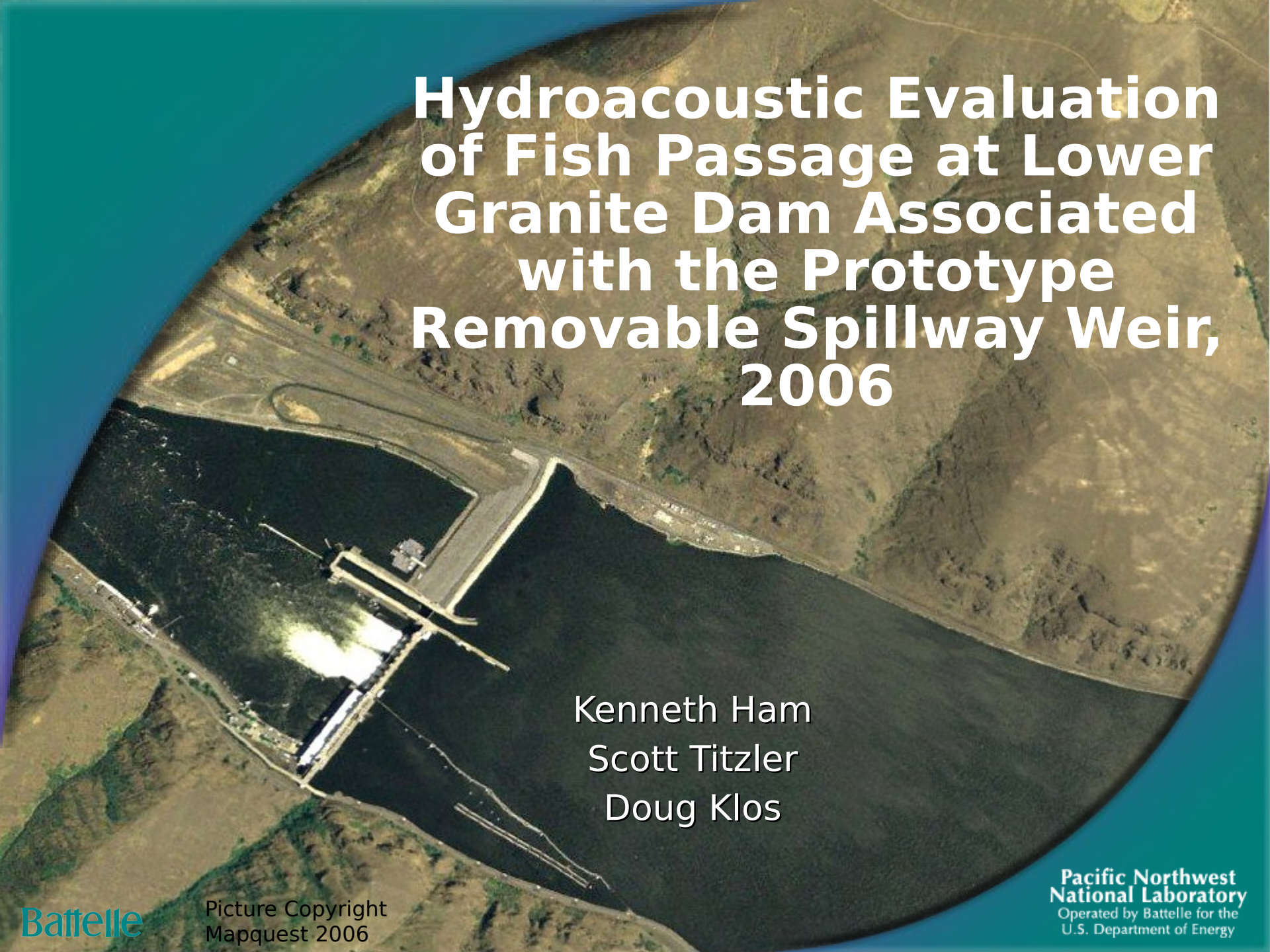
Hydroacoustic Evaluation of Fish Passage at Lower Granite Dam Associated with the Prototype Removable Spillway Weir, 2006



Kenneth Ham
Scott Titzler
Doug Klos

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Mapquest 2006

Battelle
Pacific Northwest National Laboratory
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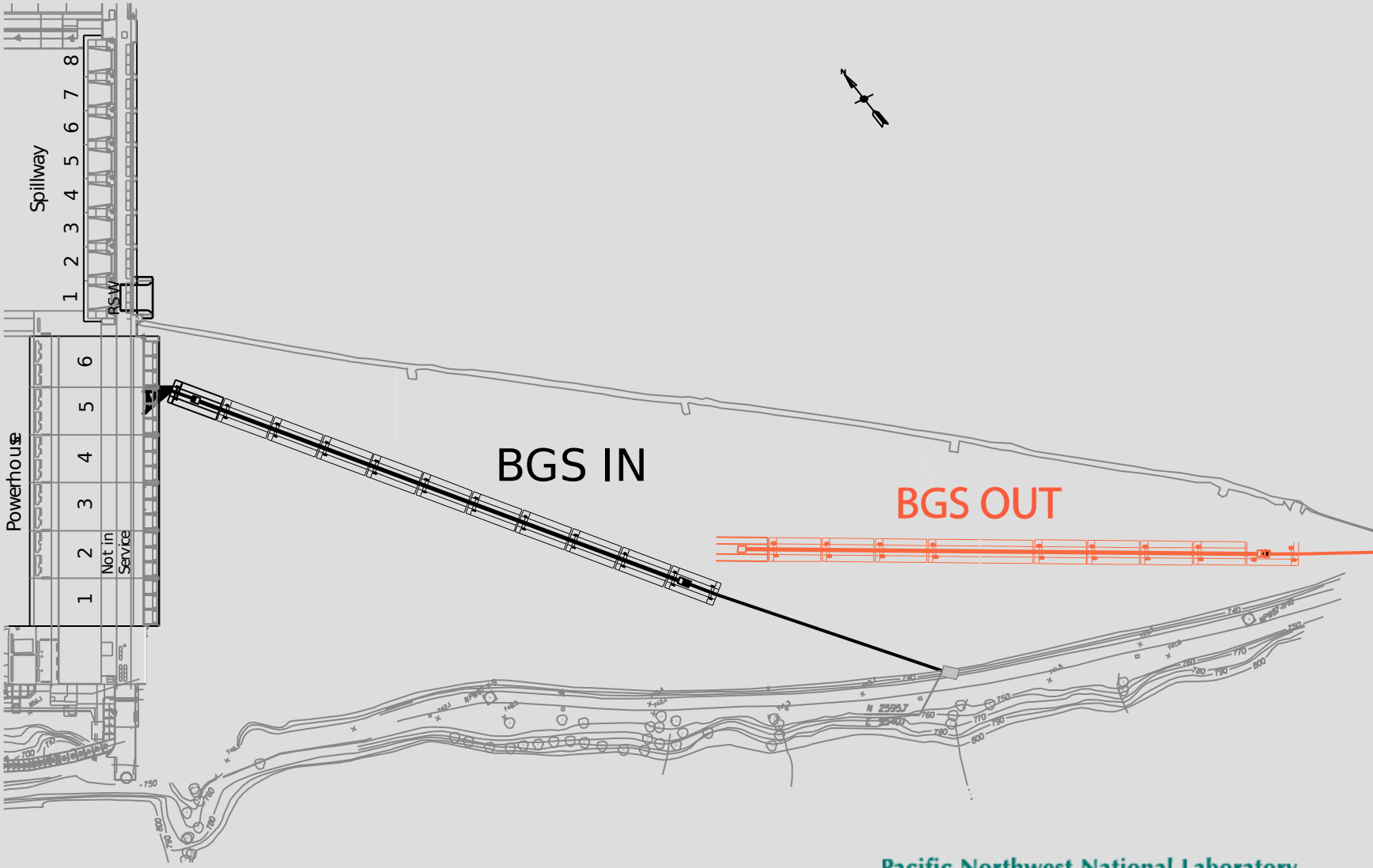
Objectives

- Compare Fish Passage Performance
  - Spring: “BGS In” vs. “BGS Out”
    - Reduced height, new attachment location
  - Summer: Bulk vs. Uniform spill

Treatment Study

- Stratified two treatment experimental design
  - **Spring**
    - BGS In vs. BGS Out
      - uniform spill pattern
      - 2-day treatment periods with 4-day blocks
  - **Summer**
    - Bulk vs. Uniform Spill
      - 1-day treatment periods with 2-day blocks

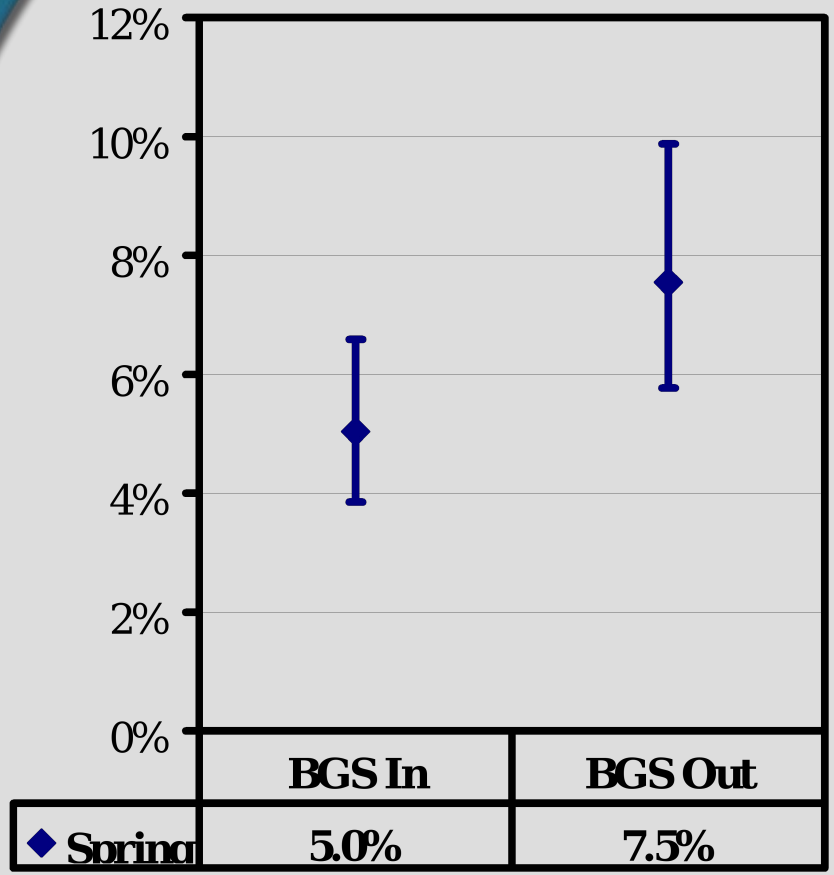
BGS In Place or Stowed Upstream

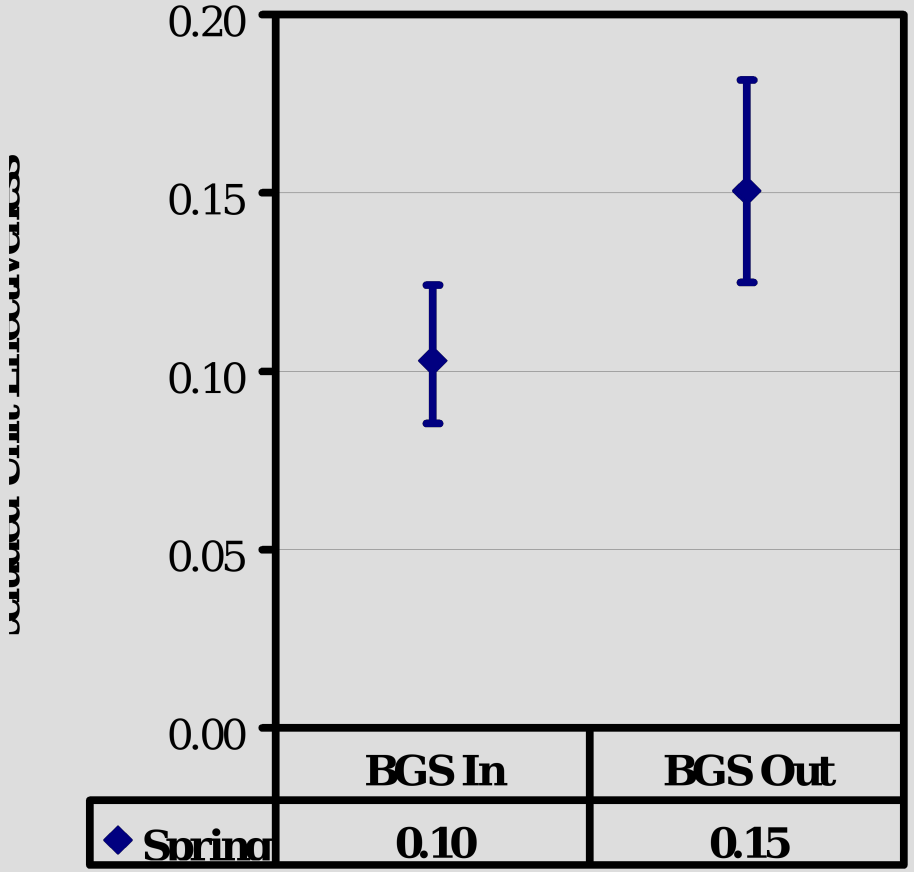


BGS Diverted Fish in Upper Water Column Toward Spillway

	FPE	SPE	SPS	FGE	RPE	RPS
BGS In	97.9%	94.0%	4.2	60.2%	22.2 %	7.3
BGS Out	98.6%	90.9%	4.0	81.6%	20.0 %	6.5

BGS Diverted 1/3rd (or more) of Spring Migrants



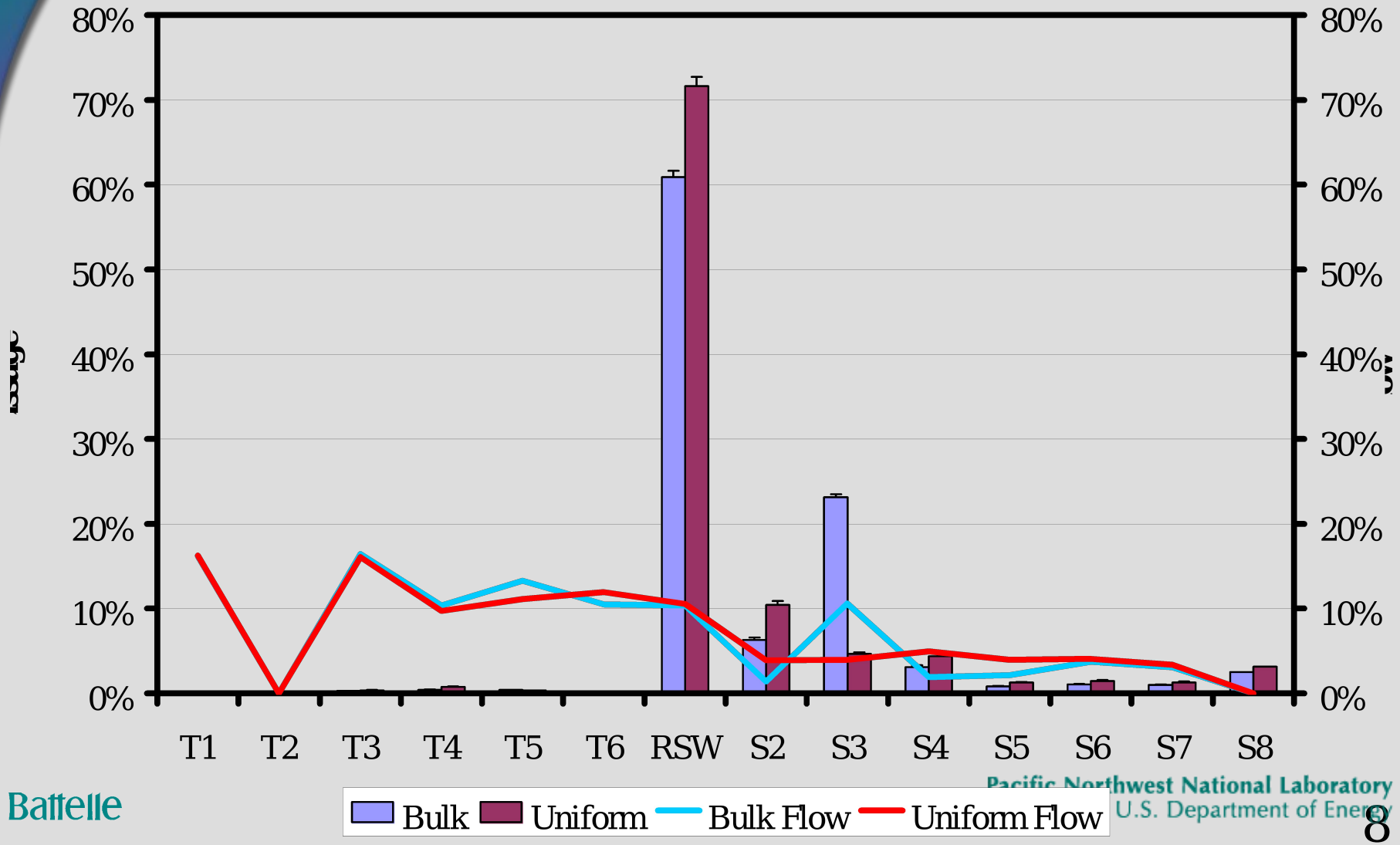


1/3rd is Lower Bound due to 1 Low block during Sockeye Peak and upstream gap correction to be implemented based on RT

Bulk Spill Decreased Summer RSW Performance

	FPE	SPE	SPS	FGE	RPE	RPS
Uniform	98.3 %	96.1%	4.5	36.8 %	88.3 %	11.4
Bulk	98.9 %	97.6%	4.5	48.9 %	69.9 %	9.0

Bulk Spill Reduced RSW Efficiency and Effectiveness



Conclusions

- BGS
  - Reduced-height BGS Diverted ≥ 33% of fish away from occluded turbine units
- Summer Bulk Spill
  - Slightly more fish passed the spillway
  - Fewer fish passed RSW